

CLAIMS

1. A semiconductor device comprising:
 - a phase change memory;
 - an antenna transforming electromagnetic waves into AC electrical signals; and
 - 5 a power supply circuit for generating power supply voltage based on the AC electrical signal which is supplied from the antenna,
wherein the phase change memory includes a plurality of bit lines that extend in a first direction, word lines that extend in a second direction perpendicular to the first direction, and phase change layers provided between the bit lines and the word lines.
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2. A semiconductor device comprising:
 - a phase change memory;
 - an antenna transforming electromagnetic waves into AC electrical signals; and
 - 15 a power supply circuit for generating power supply voltage based on the AC electrical signal which is supplied from the antenna,
wherein the phase change memory includes a plurality of bit lines that extend in a first direction, word lines that extend in a second direction perpendicular to the first direction, and phase change layers provided between the bit lines and the word lines;
and
 - 20 wherein at least one of the bit lines and the word lines transmits light.
3. The semiconductor device according to claim 1 or 2, wherein the phase change memory is provided on a glass substrate.
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4. The semiconductor device according to claim 1 or 2, wherein the phase change memory is provided on a flexible substrate.
5. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes reversibly between a crystalline state and
30 an amorphous state.

6. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes reversibly between a first crystalline state and a second crystalline state.

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7. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes only from an amorphous state to a crystalline state.

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8. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from germanium (Ge), tellurium (Te), antimony (Sb), sulfur (S), tellurium oxide (TeO_x), tin (Sn), gold (Au), gallium (Ga), selenium (Se), indium (In), thallium (Tl), cobalt (Co), and silver (Ag).

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9. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from silver (Ag), zinc (Zn), copper (Cu), aluminum (Al), nickel (Ni), indium (In), antimony (Sb), selenium (Se), and tellurium (Te).

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10. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from tellurium (Te), tellurium oxide (TeO_x), palladium (Pd), antimony (Sb), selenium (Se), and bismuth (Bi).

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11. The semiconductor device according to claim 1 or 2, wherein the semiconductor device includes one or a plurality selected from a DRAM (Dynamic Random Access Memory), an SRAM (Static Random Access Memory), an FeRAM (Ferroelectric Random Access Memory), a mask ROM (Read Only Memory), a PROM (Programmable Read Only Memory), an EPROM (Electrically Programmable Read Only Memory), an EEPROM (Electrically Erasable Programmable Read Only Memory), and a flash memory.

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12. The semiconductor device according to claim 1 or 2, wherein the semiconductor device includes one or a plurality of a clock generating circuit, a data demodulation/modulation circuit, and an interface circuit.

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13. The semiconductor device according to claim 1 or 2,
wherein the semiconductor device includes a control circuit that controls the phase change memory; and
wherein the control circuit includes a thin film transistor.